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IN THE CLAIMS

The status of the claims as presently amended is as follows:

1. *(Currently Amended)* A catalyst deterioration detecting apparatus, comprising:
a catalyst, disposed in a path of exhaust gas emitted from the engine, including ceria serving as an oxygen storage agent;
catalyst temperature sensing means for obtaining temperature of said catalyst; and
judgment means for judging whether the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range that causes NO_x conversion efficiency of said catalyst to decrease; and
deterioration detecting means for detecting a degree of deterioration of said catalyst ~~if when said judgment means determines that the temperature is obtained by said catalyst temperature sensing means is equal to or higher than an said activation temperature at which said catalyst is activated and is in [[a]] said particular temperature range causing NO_x conversion efficiency of said catalyst to decrease.~~
2. *(Original)* A catalyst deterioration detecting apparatus according to claim 1, wherein the particular temperature range causes the ceria to transform.
3. *(Currently Amended)* A catalyst deterioration detecting apparatus according to claim 1, wherein the particular temperature range is not lower than 600°C ~~[[n]]~~ or higher than 800°C.
4. *(Original)* A catalyst deterioration detecting apparatus according to claim 3, wherein the particular temperature range lies around 700°C.
5. *(Original)* A catalyst deterioration detecting apparatus according to claim 1, wherein said catalyst temperature sensing means estimates the temperature of said catalyst on the basis of a running state of the engine.

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6. *(Original)* A catalyst deterioration detecting apparatus according to claim 1, wherein said catalyst temperature sensing means estimates the temperature of said catalyst on the basis of temperature of the exhaust gas that is to be supplied to said catalyst.

7. *(Currently Amended)* A catalyst deterioration detecting apparatus ~~according to claim 1,~~ comprising:

a catalyst disposed in a path of exhaust gas emitted from the engine and including ceria serving as an oxygen storage agent;

catalyst temperature sensing means for obtaining temperature of said catalyst; and

deterioration detecting means for detecting a degree of deterioration of said catalyst if the temperature is obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range causing NO_x conversion efficiency of said catalyst to decrease,

wherein~~[[;]]~~ said deterioration detecting means includes a NO_x sensor, disposed downstream of said catalyst, for sensing concentration of NO_x included in the exhaust gas as a NO_x signal~~[[;]]~~, and

wherein said deterioration detecting means detects the degree of deterioration based on the NO_x signal, which is received from said NO_x sensor when the temperature sensed by said catalyst temperature sensing means is in the particular temperature range.

8. *(Original)* A catalyst deterioration detecting apparatus according to claim 7, wherein said deterioration detecting means detects the degree of deterioration on the basis of a variation of the NO_x signal.

9. *(Currently Amended)* A catalyst deterioration detecting apparatus according to claim 1, wherein:

said deterioration detecting means includes an upstream oxygen sensor and a downstream

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oxygen sensor, respectively disposed upstream and downstream of said catalyst, each of which is for sensing concentration of oxygen included in the exhaust gas as an oxygen signal; and

said deterioration detecting means detects the degree of deterioration by comparing the oxygen signals, respectively received from said upstream and said downstream oxygen sensors when the temperature sensed by said catalyst temperature sensing means is in the particular temperature range.

10. (*Currently Amended*) A catalyst deterioration detecting apparatus according to claim 9, comprising:

a catalyst disposed in a path of exhaust gas emitted from the engine and including ceria serving as an oxygen storage agent;

catalyst temperature sensing means for obtaining temperature of said catalyst; and

deterioration detecting means for detecting a degree of deterioration of said catalyst if the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range causing NO_x conversion efficiency of said catalyst to decrease,

wherein said deterioration detecting means includes an upstream oxygen sensor and a downstream oxygen sensor, respectively disposed upstream and downstream of said catalyst, for sensing concentration of oxygen included in the exhaust gas as an oxygen signal,

wherein said deterioration detecting means detects the degree of deterioration by comparing the oxygen signals, respectively received from said upstream and said downstream oxygen sensors when the temperature sensed by said catalyst temperature sensing means is in the particular temperature range,

wherein said deterioration detecting means detects the degree of deterioration by comparing the oxygen signals in terms of one of frequency, inversion cycle and amplitude.

11. (*Original*) A catalyst deterioration detecting apparatus according to claim 1, wherein:
said deterioration detecting means includes an oxygen sensor, disposed downstream of

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said catalyst, for sensing concentration of oxygen included in the exhaust gas as an oxygen signal; and

said deterioration detecting means detects the degree of deterioration by comparing an air/fuel-ratio variation signal, which concerns an air-fuel ratio forcefully varied when the obtained temperature is in the particular temperature range, and the oxygen signal.

12. (*Currently Amended*) A catalyst deterioration detecting apparatus according to claim ~~11~~, comprising:

a catalyst disposed in a path of exhaust gas emitted from the engine and including ceria serving as an oxygen storage agent;

catalyst temperature sensing means for obtaining temperature of said catalyst; and

deterioration detecting means for detecting a degree of deterioration of said catalyst if the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range causing NO_x conversion efficiency of said catalyst to decrease.

wherein said deterioration detecting means includes an oxygen sensor, disposed downstream of said catalyst, for sensing concentration of oxygen included in the exhaust gas as an oxygen signal.

wherein said deterioration detecting means detects the degree of deterioration by comparing an air/fuel-ratio variation signal, which concerns an air-fuel ratio forcefully varied when the obtained temperature is in the particular temperature range, and the oxygen signal, and

wherein said deterioration detecting means detects the degree of deterioration by comparing the air/fuel-ratio variation signal and the oxygen signal in terms of one of frequency, inversion cycle, and amplitude.

13. (*Currently Amended*) A catalyst deterioration detecting apparatus according to claim 1, wherein:

said deterioration detecting means includes an upstream linear A/F sensor and a

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downstream linear A/F sensor, respectively disposed upstream and downstream of said catalyst, ~~each of which is for sensing an air-fuel ratio of the exhaust gas as an A/F signal; and~~

said deterioration detecting means detects the degree of deterioration by comparing the A/F signals, respectively received from said upstream and said downstream linear A/F sensors when the obtained temperature is in the particular temperature range.

14. (*Currently Amended*) A catalyst deterioration detecting apparatus according to claim ~~13~~, comprising:

a catalyst disposed in a path of exhaust gas emitted from the engine and including ceria serving as an oxygen storage agent;

catalyst temperature sensing means for obtaining temperature of said catalyst; and

deterioration detecting means for detecting a degree of deterioration of said catalyst if the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range causing NO_x conversion efficiency of said catalyst to decrease,

wherein said deterioration detecting means includes an upstream linear A/F sensor and a downstream linear A/F sensor, respectively disposed upstream and downstream of said catalyst, for sensing an air-fuel ratio of the exhaust gas as an A/F signal,

wherein said deterioration detecting means detects the degree of deterioration by comparing the A/F signals, respectively received from said upstream and said downstream linear A/F sensors when the obtained temperature is in the particular temperature range, and

wherein said deterioration detecting means detects the degree of deterioration by comparing the A/F signals in terms of one of frequency, inversion cycle, and amplitude.

15. (*Original*) A catalyst deterioration detecting apparatus according to claim 1, wherein:

said deterioration detecting means includes a linear A/F sensor, disposed downstream of said catalyst, for sensing an air-fuel ratio of the exhaust gas as A/F signal; and

said deterioration detecting means detects the degree of deterioration by comparing an

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air/fuel-ratio variation signal, which concerns an air-fuel ratio forcefully varied when the obtained temperature is in the particular temperature range, and the A/F signal.

16. (*Currently Amended*) A catalyst deterioration detecting apparatus according to claim 15, comprising:

a catalyst disposed in a path of exhaust gas emitted from the engine and including ceria serving as an oxygen storage agent;

catalyst temperature sensing means for obtaining temperature of said catalyst; and

deterioration detecting means for detecting a degree of deterioration of said catalyst if the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range causing NO_x conversion efficiency of said catalyst to decrease.

wherein said deterioration detecting means includes a linear A/F sensor, disposed downstream of said catalyst, for sensing an air-fuel ratio of the exhaust gas as A/F signal,

wherein said deterioration detecting means detects the degree of deterioration by comparing an air/fuel-ratio variation signal, which concerns an air-fuel ratio forcefully varied when the obtained temperature is in the particular temperature range, and the A/F signal, and

wherein said deterioration detecting means detects the degree of deterioration by comparing the air/fuel-ratio variation signal and the A/F signal in terms of one of frequency, inversion cycle, and amplitude.

17. (*Currently Amended*) A catalyst deterioration detecting apparatus, comprising:

a catalyst, disposed in a path of exhaust gas emitted from the engine, including ceria serving as an oxygen storage agent ;

catalyst temperature sensing means for sensing temperature of said catalyst; and

judgment means for judging whether the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range that causes the ceria to transform;

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and

deterioration detecting means for detecting a degree of deterioration of said catalyst ~~if when said judgment means determines that the temperature is obtained by said catalyst temperature sensing means is equal to or higher than an said activation temperature at which said catalyst is activated and is in [[a]] said particular temperature range causing the ceria to transform.~~

18. (Currently Amended) A catalyst deterioration detecting apparatus according to claim 1, comprising:

~~— a catalyst, disposed in a path of exhaust gas emitted from the engine, including ceria serving as an oxygen storage agent;~~
~~— catalyst temperature sensing means for obtaining temperature of said catalyst; and~~
~~— deterioration detecting means for detecting a degree of deterioration of said catalyst if the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a wherein said particular temperature range causing causes an oxygen storage capacity of said catalyst to reduce.~~

19. (Currently Amended) A catalyst deterioration detecting apparatus, comprising:

a catalyst, disposed in a path of exhaust gas emitted from the engine, including ceria serving as an oxygen storage agent;

catalyst temperature sensing means for sensing temperature of said catalyst; and
judgment means for judging whether the temperature obtained by said catalyst temperature sensing means is equal to or higher than an activation temperature at which said catalyst is activated and is in a particular temperature range around 700°C; and

deterioration detecting means for detecting a degree of deterioration of said catalyst ~~if when said judgment means determines that the temperature is obtained by said catalyst temperature sensing means is equal to or higher than an said activation temperature at which said catalyst is activated and is in [[a]] said particular temperature range around 700°C.~~